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- (71) Applicant (for all designated States except US): MO-TOROLA INC. [US/US]: 1303 E. Algonquin Road. Schaumburg. IL 60196 (US).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): DOLBEAR, Catherine, Mary [GB/GB]: 26 Regent Court. Reading. Berkshire RG1 7HW (GB). HOBSON, Paola, Marcella [GB/GB]: 24 Soper Grove, Basingstoke, Hampshire RG21 5PU (GB).

- (74) Agent: TRELEVEN, Colin: Motorola European Intellectual Property Operations. Midpoint. Alencon Link. Basingstoke, Hampshire RG21 7PL (GB).
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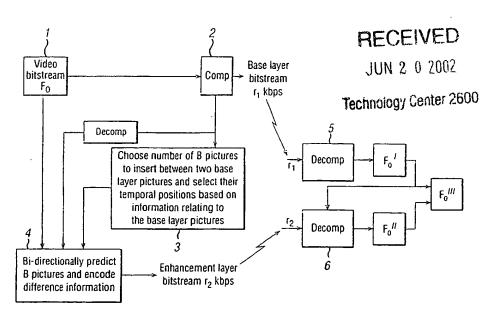
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[Continued on next page]

(54) Title: METHOD AND APPARATUS FOR VIDEO ENCODING



(57) Abstract: A method of enchancing a video bit stream using temporal scalability, wherein the number of bits or a temporal position of a bidirectionally predicted picture in an enhancement layer is determined with reference to a corresponding characteristic of pictures in another layer of layers, such as a base layer, of the video bit stream and the peak signal to noise ration of the B picture is mathched to that of the pictures in the layer below. By endeavouring to align the characteristics of the bidirectially predicted picture or pictures with the existing picture or pictur4es in the lower layer or layers, and imprived video sequence can be encoded and decoded for viewing by a user.

PATENT COOPERATION TREATY

PCT To: MOTOROLA European Intel. Property Attn. Treleven, Colin Midpoint, Alencon Link Basingstoke Hampshire R621 PL UNITED KINGDOM Applicants or agent's file reference CM00740P/CT International application No. PCT/CP 01/07886 Applicant MOTOROLA INC The applicant is hereby notified that the International Search Report has been established and fist transmitted herewith. The applicant is nettled, the so wishes, to amend the claims of the international Applications (see Riule 45): Where? The time firm for fifing such amendments is normally 2 months from the date of transmitted therewith. Where? The time firm for fifing such amendments is normally 2 months from the date of transmitted of the International Search Report has been established and fist transmitted therewith. Where? Directly to the International European Colombettes 121 General 200, Switzerfand Fasomile No. (41-22) 740.14.35 For more detailed instructions, see the notes on the accompanying sheet. 2. The applicant is hereby notified that the International Search Report will be established and that the declaration under Article 17(2)(a) to that effect is transmitted herewith. The profest together with the decision thereon has been ransmitted to the International Bureau to WPIO 3. With regard to the protest against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that: the profest together with the decision thereon has been ransmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the decision thereon to the decision thereon to the decision thereon to the designated Offices. A Further action(s): The applicant is reduced to the protest; the applicant will be notified as soon as a decision is made. 4. Further action(a): The applicant is reduced of the following: Shortly after 16 menths from the promity data, the international application, or of the protery data (in the applicant must see the international application, or of the p		DOT	
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Authorized officer

Jolanda Offerman-Hazeleger

These Notes are intended to give the basic instructions concerning the filing of amendments under article 19. The Notes are based on the requirements of the Patent Cooperation Treaty, the Regulations and the Administrative Instructions under that Treaty. In case of discrepancy between these Notes and those requirements, the latter are applicable. For more detailed information, see also the PCT Applicant's Guide, a publication of WIPO.

In these Notes, "Article", "Rule", and "Section" refer to the provisions of the PCT, the PCT Regulations and the PCT Administrative Instructions respectively.

INSTRUCTIONS CONCERNING AMENDMENTS UNDER ARTICLE 19

The applicant has, after having received the international search report, one opportunity to amend the claims of the international application. It should however be emphasized that, since all parts of the international application (claims, description and drawings) may be amended during the international preliminary examination procedure, there is usually no need to file amendments of the claims under Article 19 except where, e.g. the applicant wants the latter to be published for the purposes of provisional protection or has another reason for amending the claims before international polication. Furthermore, it should be emphasized that provisional protection is available in some States only.

What parts of the international application may be amended?

Under Article 19, only the claims may be amended.

During the international phase, the claims may also be amended (or further amended) under Article 34 before the International Preliminary Examining Authority. The description and drawings may only be amended under Article 34 before the International Examining Authority.

Upon entry into the national phase, all parts of the international application may be amended under Article 28 or, where applicable, Article 41.

When?

Within 2 months from the date of transmittal of the international search report or 16 months from the priority date, whichever time limit expires later. It should be noted, however, that the amendments will be considered as having been received on time if they are received by the International Bureau after the expiration of the applicable time limit but before the completion of the technical preparations for international publication (Rule 46.1).

Where not to file the amendments?

The amendments may only be filed with the International Bureau and not with the receiving Office or the International Searching Authority (Rule 46.2).

Where a demand for international preliminary examination has been is filed, see below.

How?

Either by cancelling one or more entire claims, by adding one or more new claims or by amending the text of one or more of the claims as filed.

A replacement sheet must be submitted for each sheet of the claims which, on account of an amendment or amendments, differs from the sheet originally filed.

All the claims appearing on a replacement sheet must be numbered in Arabic numerals. Where a claim is cancelled, no renumbering of the other claims is required. In all cases where claims are renumbered, they must be renumbered consecutively (Administrative Instructions, Section 205(b)).

The amendments must be made in the language in which the international application is to be published.

What documents must/may accompany the amendments?

Letter (Section 205(b)):

The amendments must be submitted with a letter.

The letter will not be published with the international application and the amended claims. It should not be confused with the "Statement under Article 19(1)" (see below, under "Statement under Article 19(1)").

The letter must be in English or French, at the choice of the applicant. However, if the language of the international application is English, the letter must be in English; if the language of the international application is French, the letter must be in French.

Notes to Form PCT/ISA/220 (first sheet) (January 1994)

The letter must indicate the differences between the claims as filed and the claims as amended. It must, in particular, indicate, in connection with each claim appearing in the international application (it being understood that identical indications concerning several claims may be grouped), whether

- the claim is unchanged;
- (ii) the claim is cancelled;
- (iii) the claim is new;
- (iv) the claim replaces one or more claims as filed;
- (v) the claim is the result of the division of a claim as filed.

The following examples illustrate the manner in which amendments must be explained in the accompanying letter:

- [Where originally there were 48 claims and after amendment of some claims there are 51]:
 "Claims 1 to 29, 31, 32, 34, 35, 37 to 48 replaced by amended claims bearing the same numbers; claims 30, 33 and 36 unchanged; new claims 49 to 51 added."
- [Where originally there were 15 claims and after amendment of all claims there are 11]: "Claims 1 to 15 replaced by amended claims 1 to 11."
- [Where originally there were 14 claims and the amendments consist in cancelling some claims and in adding new claims]:
 "Claims 1 to 6 and 14 unchanged; claims 7 to 13 cancelled; new claims 15, 16 and 17 added." or "Claims 7 to 13 cancelled; new claims 15, 16 and 17 added; all other claims unchanged."
- 4. [Where various kinds of amendments are made]: "Claims 1-10 unchanged; claims 11 to 13, 18 and 19 cancelled; claims 14, 15 and 16 replaced by amended claim 14; claim 17 subdivided into amended claims 15, 16 and 17; new claims 20 and 21 added."

"Statement under article 19(1)" (Rule 46.4)

The amendments may be accompanied by a statement explaining the amendments and indicating any impact that such amendments might have on the description and the drawings (which cannot be amended under Article 19(1)).

The statement will be published with the international application and the amended claims.

It must be in the language in which the international appplication is to be published.

It must be brief, not exceeding 500 words if in English or if translated into English.

It should not be confused with and does not replace the letter indicating the differences between the claims as filed and as amended. It must be filed on a separate sheet and must be identified as such by a heading, preferably by using the words "Statement under Article 19(1)."

It may not contain any disparaging comments on the international search report or the relevance of citations contained in that report. Reference to citations, relevant to a given claim, contained in the international search report may be made only in connection with an amendment of that claim.

Consequence if a demand for international preliminary examination has already been filed

If, at the time of filing any amendments under Article 19, a demand for international preliminary examination has already been submitted, the applicant must preferably, at the same time of filing the amendments with the International Bureau, also file a copy of such amendments with the International Preliminary Examining Authority (see Rule 62.2(a), first sentence).

Consequence with regard to translation of the international application for entry into the national phase

The applicant's attention is drawn to the fact that, where upon entry into the national phase, a translation of the claims as amended under Article 19 may have to be furnished to the designated/elected Offices, instead of, or in addition to, the translation of the claims as filed.

For further details on the requirements of each designated/elected Office, see Volume II of the PCT Applicant's Guide.

O PATENT COOPERATION TREATY

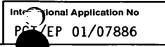
PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference CM00740P/CT		of Transmittal of International Search Report 20) as well as, where applicable, item 5 below.		
International application No.	International filing date (day/month/year)	(Earliest) Priority Date (day/month/year)		
PCT/EP 01/07886	09/07/2001	11/07/2000		
Applicant				
MOTOROLA INC				
This International Search Report has bee according to Article 18. A copy is being tr	en prepared by this International Searching Aut ansmitted to the International Bureau.	hority and is transmitted to the applicant		
This International Search Report consists X It is also accompanied by	s of a total of sheets. y a copy of each prior art document cited in this	s report.		
Basis of the report				
	international search was carried out on the balless otherwise indicated under this item.	sis of the international application in the		
the international search v Authority (Rule 23.1(b)).	was carried out on the basis of a translation of t	the international application furnished to this		
was carried out on the basis of the	ne sequence listing:	nternational application, the international search		
	onal application in written form.	-		
I H	ernational application in computer readable for	m.		
	furnished subsequently to this Authority in written form.			
	o this Authority in computer readble form. bsequently furnished written sequence listing o	toes not an heyand the disclosure in the		
	as filed has been furnished.	accomoting boyond the disciplination in the		
the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished				
2. Certain claims were for	und unsearchable (See Box I).			
3. Unity of invention is la	3. Unity of invention is lacking (see Box II).			
4. With regard to the title ,				
the text is approved as submitted by the applicant.				
the text has been established by this Authority to read as follows:				
1 <u>-</u>	submitted by the applicant.	riby as it appears in Roy III. The applicant may		
the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.				
6. The figure of the drawings to be put	olished with the abstract is Figure No.	8		
as suggested by the app		None of the figures.		
because the applicant failed to suggest a figure.				
because this figure better characterizes the invention.				

INTERNATIONAL SEARCH REPORT



		2. 02, 07 000
A. CLASSIF IPC 7	H04N7/50 H04M/26	
According to	International Patent Classification (IPC) or to both national classification	tion and IPC
B. FIELDS	SEARCHED	
Minimum do IPC 7	cumentation searched (classification system followed by classificatio $H04N$	n symbols)
	ion searched other than minimum documentation to the extent that su	
EPO-Int	ata base consulted during the international search (name of data bas	e and, where practical, search terms used)
C. DOCUME	ENTS CONSIDERED TO BE RELEVANT	
Category °	Citation of document, with indication, where appropriate, of the rele	evant passages Relevant to claim No.
Y A	KATATA H ET AL: "TEMPORAL SCALAB BASED ON IMAGE CONTENT" INTERNATIONAL ORGANIZATION FOR STANDARDIZATION - ORGANISATION INTERNATIONALE DE NORMALISATION, July 1995 (1995-07), pages 1-2, XP000669194 page 1, paragraph 1 - paragraph 2 figure 1	XX, XX,
X Furth	ner documents are listed in the continuation of box C.	Patent family members are listed in annex.
A document defining the general state of the art which is not considered to be of particular relevance *E* earlier document but published on or after the international filing date *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) *O* document published prior to the international filing date but later than the priority date claimed *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention clated to understand the principle or theory underlying the or priority date and not in conflict with the application but cited to understand the principle or theory underlying the or priority date and not in conflict with the application but cited to understand the principle or theory underlying the or priority date and not in conflict with the application but cited to understand the principle or theory underlying the or priority date and not in conflict with the application but cited to understand the principle or theory underlying the or priority date and not in conflict with the application but cited to understand the principle or theory underlying the or priority date and not in conflict with the application but cited to understand the principle or theory underlying the or priority date and not in conflict with the application but cited to understand the principle or theory underlying the or priority date and not in conflict with the application but cited to understand the principle or theory underlying the cited to establish the publication but cited to understand the principle or theory underlying the cited to establish the publication but cited to understand the principle or theory underlying the cited to establish the publication but cited to understand the principle or theory underlying the cited to establish the publication but cited to understand the principl		
Date of the actual completion of the international search 23 January 2002 Date of mailing of the international search report 30/01/2002		
		Authorized officer Foglia, P

1

INTERNATIONAL SEARCH REPORT



	ation) DOCUMENTS CONSIDE O BE RELEVANT Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Category °	Citation of document, with indication, where appropriate, or the relevant passages	nelevani to claim No.
Y	ISHTIAQ F ET AL: "A rate control method for H.263 temporal scalability" IMAGE PROCESSING, 1999. ICIP 99. PROCEEDINGS. 1999 INTERNATIONAL CONFERENCE ON KOBE, JAPAN 24-28 OCT. 1999, PISCATAWAY, NJ, USA, IEEE, US, 24 October 1999 (1999-10-24), pages 280-284, XP010368708 ISBN: 0-7803-5467-2	8
4	page 280, paragraph 1 -page 282, paragraph 3.3; figures 1-4	1-7,9-11
A	HEMAMI S S: "Distortion analyses for temporal scalability coding techniques" IMAGE PROCESSING, 1999. ICIP 99. PROCEEDINGS. 1999 INTERNATIONAL CONFERENCE ON KOBE, JAPAN 24-28 OCT. 1999, PISCATAWAY, NJ, USA, IEEE, US, 24 October 1999 (1999-10-24), pages 349-353, XP010368869 ISBN: 0-7803-5467-2 abstract page 349, paragraph 1 -page 350, paragraph 2	1-11
]

1

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1,2,4-11

Method of enhancing a video bit stream using temporal scalability wherein PSNR 'allocated bits! of B pictures in an enhancement layer are determined with reference to PSNR 'allocated bits! of pictures in another layer.

2. Claims: 3,6-11

Method of enhancing a video bit stream using temporal scalability wherein temporal positions of predicted pictures in an enhancement layer are determined to be spaced evenly with reference to temporal positions of pictures in another layer.

Box I Obs rvati ns wher certain claims were found unsearchable (Continuation of Item 1 of first sheet)
This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:
Claims Nos.: because they relate to subject matter not required to be searched by this Authority, namely:
Claims Nos.: because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. Claims Nos.: because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).
Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)
This International Searching Authority found multiple inventions in this international application, as follows:
see additional sheet
As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. X As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
Remark on Protest The additional search fees were accompanied by the applicant's protest. No protest accompanied the payment of additional search fees.

Original (for SUBMISSION) - printed on 05.07.2001 02:15:54 PM

0	F r receiving Office use only		
0-1	International Application No.	PCT/EP 0 1 / 0 7 8 8 6	
0-2	International Filing Date	0 9 JUL 2001 (0 9. 07. 2001)	
0-3	Name of receiving Office and "PCT International Application"	EUROPEAN PATENT OFFICE PCT INTERNATIONAL APPLICATION	
0-4	Form - PCT/RO/101 PCT Request		
0-4-1	Prepared using	PCT-EASY Version 2.91 (updated 01.01.2001)	
0-5	Petition		
	The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty		
0-6	Receiving Office (specified by the applicant)	European Patent Office (EPO) (RO/EP)	
0-7	Applicant's or agent's file reference	CM00740P/CT	
1	Title of invention	METHOD AND APPARATUS FOR VIDEO ENCODING	
II	Applicant		
II-1	This person is:	applicant only	
11-2	Applicant for	all designated States except US	
11-4	Name	MOTOROLA INC	
11-5	Address:	1303 E.Algonquin Road	
		Schaumburg, IL 60196	
		United States of America	
11-6	State of nationality	us	
11-7	State of residence	us	
11-8	Telephone No.	00 1 847 576 3750	
11-9	Facsimile No.	00 1 847 576 3750	
111-1	Applicant and/or inventor		
-1-1	This person is:	applicant and inventor	
III-1-2	Applicant for	US only	
III-1 - 4	Name (LAST, First)	DOLBEAR, Catherine, Mary	
III-1-5	Address:	26 Regent Court	
		Reading, Berkshire RG1 7HW	
		United Kingdom	
III-1-6	State of nationality	GB	
III-1-7	State of residence	GB	

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CM00740P/CT

111-2	Applicant and/ r inv ntor		
III-2-1	This person is:	applicant and inventor	
111-2-2	Applicant for	US only	
111-2-4	Name (LAST, First)	HOBSON, Paola, Marcella	
111-2-5	Address:	24 Soper Grove	
		Basingstoke, Hampshire RG21 5PU	
		United Kingdom	
111-2-6	State of nationality	GB	
111-2-7	State of residence	GB	
IV-1	Agent or common representative; or		
	The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as:	agent	
IV-1-1	Name (LAST, First)	TRELEVEN, Colin	
IV-1-2	Address:	Motorola European Intellectual	
		Property Operations	
		Midpoint	
		Alencon Link	
		Basingstoke, Hampshire RG21 7PL	
IV-1-3	Telephone No.	United Kingdom 01256 790271	
IV-1-4	Facsimile No.	01256 790271	
V	Designation of States	01236 811319	
V-1	Regional Patent (other kinds of protection or treatment, if any, are specified between parentheses after the designation(s) concerned)	AP: GH GM KE LS MW MZ SD SL SZ TZ UG ZW and any other State which is a Contracting State of the Harare Protocol and of the PCT EA: AM AZ BY KG KZ MD RU TJ TM and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT EP: AT BE CH&LI CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE TR and any other State which is a Contracting State of the European Patent Convention and of the PCT OA: BF BJ CF CG CI CM GA GN GW ML MR NE SN TD TG and any other State which is a member State of OAPI and a Contracting State of the PCT	
V-2	National Patent (other kinds of protection or treatment, if any, are specified between parentheses after the designation(s) concerned)	AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH&LI CN CR CU CZ DE DK DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW	



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CM00740P/CT

V-5	Precauti nary Designation Statement	<u> </u>	
	In addition to the designations made		
	under items V-1, V-2 and V-3, the		
	applicant also makes under Rule 4.9(b)		
	all designations which would be permitted under the PCT except any		
	designation(s) of the State(s) indicated		
	under item V-6 below. The applicant		
	declares that those additional		
	designations are subject to confirmation and that any designation which is not		
	confirmed before the expiration of 15		
	months from the priority date is to be		
	regarded as withdrawn by the applicant		
V-6	at the expiration of that time limit. Exclusion(s) from precautionary	11011	
V-0	designations	NONE	
VI-1	Priority claim of earlier national		
	application		
VI-1-1	Filing date	11 July 2000 (11.07.	2000)
VI-1-2	Number	0017032.4	
VI-1-3	Country	GB	
VII-1	International Searching Authority Chosen	European Patent Offi	ce (EPO) (ISA/EP)
VIII	Check list	number of sheets	electronic file(s) attached
VIII-1	Request	4	-
VIII-2	Description	14	_
VIII-3	Claims	2	-
VIII-4	Abstract	1	EZABST00.TXT
VIII-5	Drawings	10	-
VIII-7	TOTAL	31	
	Accompanying items	paper document(s) attached	electronic file(s) attached
VIII-8	Fee calculation sheet	V	-
VIII-9	Separate signed power of attorney	✓	-
VIII-10	Copy of general power of attorney	reference no. <no.></no.>	-
VIII-12	Priority document(s)	Item(s) VI-1	_
VIII-16	PCT-EASY diskette	-	diskette
VIII-18	Figure of the drawings which should accompany the abstract	78	
VIII-19	Language of filing of the international application	English	
IX-1	Signature of applicant or agent		
IX-1-1	Name (LAST, First)	TRELEVEN, Colin	

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10-1	Date of actual receipt of the purported international application	0 9 JUL 2001	(0 9. 07. 2001)	
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10-2	Drawings:	0 1111 0004	(-0.07.2004)
10-2-1	Received	-9 JUL 2001	(-9 07 2001)
10-2-2	Not received		/
10-3	Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application		
10-4	Date of timely receipt of the required corrections under PCT Article 11(2)		
10-5	International Searching Authority	ISA/EP	
10-6	Transmittal of search copy delayed until search fee is paid		

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44 4	Data of receipt of the receipt convenient	
11-1	Date of receipt of the record copy by	
	1	
	the International Bureau	
	Title international Darous	L.,